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A PROPOSAL TO IMPROVE CONFIGURATION MANAGEMENT OF SHIPS AND SHI--ETC(U)
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A PROPOSAL TO IMPROVE CONFIGURATION MANAGEMENT OF SHIPS AND SHIPBOARD EQUIPMENT

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(6) A PROPOSAL TO IMPROVE CONFIGURATION MANAGEMENT OF SHIPS AND SHIPBOARD EQUIPMENT

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In the late 1960's the KNOX Class, FF 1052 ocean escorts, began entering the fleet. When a sailor who was accustomed to serving in the crowded FLETCHER and GEARING Class destroyers went on board the new KNOX Class, he was immediately impressed with the size and the vast empty spaces. Now, less than ten years and one or two overhauls later, the sailor is beginning to get that same crowded feeling in the KNOX Class. What has happened in these few years to give him this feeling?

We still have the same hull with the same basic services. We have, however, installed the facilities to support the LAMPS helicopter, a basic point defense missile system, a towed array sonar, increased the communications, and provided for pollution abatement, just to name a few. With all of these additions, there has been an increase in the crew to maintain and operate the new equipment. The ship must support these men. In doing this, the ship is rapidly reaching, and in some cases exceeding, the designed capability to make water, to provide cooling water, to generate electrical power, to store fuel and supplies, and we are even reaching the limits of our ability to hold the crew's waste.

A good example of the problem is the air conditioning capacity. The air conditioning use factor, the ratio of total air conditioning capacity to the total air conditioning requirement, has changed from the designed .97 to the present .8. Remedial action is required when the factor reaches .9. We are now installing an additional air conditioning unit to increase the ship's capability. This situation is not unique to this Class. It can be found in newer classes as well as the older ones.

Another difference our sailor will find when he looks around a KNOX Class is that the equipment is much more complicated. This requires his training to be of a higher level, the technical manuals more detailed, and the repair parts required more numerous and more expensive. What we call Integrated Logistics Support (ILS) has now become a very important factor in the design and installation of equipments in ships. What is required is a procedure to insure that, prior to any improvement being installed in a ship, the affect that the addition of this improvement will have to the whole ship is evaluated and that once the new equipment or change has been installed the improvement can and will be supported.

At this point, we should turn our attention to the procedures that are now used to manage the installation of improvements to our ships. The present system has evolved from past organization and disciplines. There are several types of alterations and modifications. The three major mechanisms that are used are the ordnance alteration, the field change, and the ship alteration. The ordnance alteration had its origin in BUORD and has changed little since then. In fact you can still look in "NAVSEA ORDALT ØØ," a listing of all ORDALTs, and find such interesting alterations still listed as that which regunned the battleships NEW YORK and TEXAS.

The field change is applicable to electronic equipments. These may be as minor as changing one resistor to a complete change to a major component. Areas not covered by these types of alterations are usually ship alteration. A ship alteration may also be required to install an ordnance alteration or a field change. Each of these procedures has a separate method of being proposed, approved, budgeted for, scheduled, installed, and recorded. Where the alteration has an impact on training, repair parts and technical documents (at both the equipment and system level), the procedures may or may not take these factors into account in either the development, execution or audit procedures. They may also not account for the affect on the ship as a whole. This has resulted in confusion in the configuration of our ships and equipments and has jeopardized our ability to maintain them in a combat ready condition. These competing and varied procedures have resulted in an inefficient use of our resources of time, money, and manpower and have lessened our credibility at the budget table.

The manner in which we make changes to electronics equipment is a good example of this problem. We receive information from many sources concerning problems in an equipment. This information can be from the ship itself, Board of Inspection and Survey, through visits by engineer to the ship, etc. A solution to the problem is found and a field change is issued. This issuing of the field change may be done completely without regard for the impact on the ship, and the logistics required to support the change. Expenditure for materials may occur without considering the resources required to install the change. In some instances a concurrent ship alteration may be required to modify the ship external to the equipment. Usually this need is not discovered until the field change is about to be installed. When installed, the fact that the installation has been completed may not be recorded. Last but not least is the fact that a large majority of field change accomplishments are permissive. This has resulted in the configuration management of improvements being a hodgepodge.

In order to improve this situation, a study has been made which resulted in a proposal to better manage the methods by which we approve, develop, schedule and control improvements to ships. Meanwhile a related effort is nearing completion to improve configuration status accounting in ships.

You may now be asking yourselves, "What has this paper got to do with me? I am here to learn and contribute to new techniques. I am a professional engineer, naval architect, or in a related profession."

Well, let me put it bluntly. You are the same engineer who will probably sponsor the next generation of alterations. The aim of this presentation is two-fold. To inform you as a corporate body, we have done a less than professional job in modifying the ships of the

active fleet. You are also being informed as to what will be required of you to successfully have your proposed alteration, a professional enhancement to the ship or equipment, finally installed in the active fleet with the support it needs to fully accomplish the intended purpose.

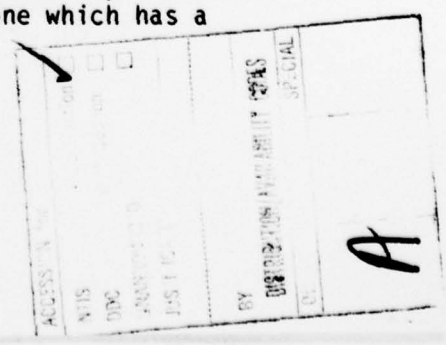
The Navy needs your proposals for improvements, both technical and military. The Navy needs you to provide informed, knowledgeable muscle to progress an improvement through a system, and the best way to do that is to know the system before you start, a system that provides the minimum bureaucratic constraints to accomplish a fully integrated and supported alteration.

Now to the proposal:

All alterations will be categorized as either ship alterations or equipment alterations. A ship alteration is any change to the ship's hull, or any change to the ship's permanently installed equipment, which requires a change to an interface with an existing system or a change to the ship's hull. An equipment alteration is any change to a permanently installed equipment which does not require a change to the interface with an existing system or a change to the ship's hull. The reason for this breakdown is three-fold. First, for equipment on several classes of ships, one alteration with a common ILS change package can be written for all classes of ships. Our present system would not provide for this, especially in the hull, mechanical and electrical areas where each class would require a separate alteration. The second reason is that, under the present system, since it is done by classes and the alterations are scheduled for by priority within classes, the same equipment on different class ships have different configurations. This greatly compounds the logistic support. The last reason is that we are moving toward greater intervals between overhauls in shipyards. The equipment alterations are the types which probably can be accomplished between overhauls, thus speeding up the improvement to the fleet.

Each of the two categories of alterations would also be classed according to the type of industrial capability required to make the installations. There would be three classes. The first would require the capability of a shipyard. The second would be that capability found in an intermediate maintenance activity, such as a tender, or by a special installation team. The last class would be accomplished by the ship's force. This breakdown would allow the lowest level to install the alteration which would insure that it could be scheduled for installation as rapidly as possible. It would also provide that the scheduling could be done by the level that has control of the activities which would perform the work.

Alterations would also be classed as either technical improvements or military improvement. A technical improvement is one which has a



primary purpose of improving the maintainability and reliability of the installed equipment, or minimizing or eliminating a safety hazard. Because of this, the approval of technical improvements would be granted by the technical sponsors.

A military improvement is one which increases the military capability of the equipment. This would require the approval of the Chief of Naval Operations.

In both technical and military improvements, a set procedure would be followed prior to the granting of approval to develop the alteration. The feasibility of installing the improvement in the ship would be examined and the prospective availability of the logistic support would be determined.

When the alterations have been categorized and placed in classes, they would then be ranked in priority order. Separate listings of ship alterations and equipment alterations would be maintained. In the case of equipment alterations, the listing would be one for each of the classifications according to installing activities. In the case of ship alterations, the listing would be by installing activity, further broken down by class of ships.

Based upon these listings, the alterations would be scheduled for accomplishment within a certain fiscal year. The scheduling would be based upon the ship's schedule, the time needed for design, the industrial capability, availability of the integrated logistic support lead time for material procurement, kit development and the funds available to provide for the installation.

These schedules would then be available for all to use in budgeting and preparing their plans to support the installation.

One area that would benefit greatly by having such a schedule available would be that of manning our ships. The manning required at the end of some future overhaul could be determined well in advance, three to four years. With this information, the manning requirements could be calculated, and trained personnel be ready when the ship leaves the yard. Under the present system this is not possible. Having the manning determined this far in advance would also allow for the development of alterations to provide for the berthing and support of any additional personnel or be cause not to develop the alteration to begin with.

The schedule would also allow for the cancellation of the lower priority alteration which will probably never be done because of the lack of time and funds. By recognizing these cancellations early, resources will not be wasted on this development.

A final area is that of configuration status accounting. Once the alteration is made, we must have available to all that are providing logistics support, the current status of the ship's configuration. The Navy has directed the Ships Equipment Configuration Accounting System, SECAS, as the means of maintaining this status.

This proposal may sound complicated and administratively burdensome. With the use of automatic data processing it need not be. By the proper implementation many of the problems that we have today would be overcome and hopefully when we install an improvement, the ship's combat readiness will be improved.